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Comment on "route from discreteness to the continuum for the Tsallis q -entropy"

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Abstract

© 2018 American Physical Society. Several years ago, it had been discussed that nonlogarithmic entropies, such as the Tsallis q-entropy cannot be applied to systems with continuous variables. Now, in their recent paper [Phys. Rev. E 97, 012104 (2018)10.1103/PhysRevE.97.012104], Oikonomou and Bagci have modified the form of the q-entropy for discrete variables in such a way that its continuum limit exists. Here, it is shown that this modification violates the expandability property of entropy, and their work is actually supporting evidence for the absence of the q-entropy for systems with continuous variables.

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References

[1] R. Landauer, IBM J. Res. Dev. 5, 183 (1961). 10.1147/rd.53.0183
[2] Maxwell's Demon 2, edited by H. Leff and A. F. Rex (CRC, Boca Raton, FL, 2002).
[3] A. Ben-Naim, Entropy Demystified (World Scientific, Singapore, 2008).
[4] J. D. Walecka, Fundamentals of Statistical Mechanics-Manuscript and Notes of Felix Bloch (Imperial College Press, London, 2000).
[5] E. T. Jaynes, in Brandeis Lectures, reprinted in E. T. Jaynes: Papers on Probability, Statistics and Statistical Physics, edited by R. D. Rosenkrantz (Kluwer, Dordrecht, 1989).
[6] T. M. Cover and J. A. Thomas, Elements of Information Theory, 2nd ed. (Wiley, Hoboken, NJ, 2006).
[7] S. Abe, Europhys. Lett. 90, 50004 (2010). 10.1209/0295-5075/90/50004
[8] S. Abe, Europhys. Lett. 92, 40006 (2010). 10.1209/0295-5075/92/40006
[9] T. Oikonomou and G. B. Bagci, Phys. Rev. E 97, 012104 (2018). 10.1103/PhysRevE.97.012104
[10] C. Tsallis, J. Stat. Phys. 52, 479 (1988). 10.1007/BF01016429
[11] A. I. Khinchin, Mathematical Foundations of Information Theory (Dover, New York, 1957).
[12] S. Abe, Phys. Lett. A 271, 74 (2000). 10.1016/S0375-9601(00)00337-6